

# Chronic Coronary Disease

## Lifestyle Interventions

- Mediterranean diet can reduce CV events by up to 65% in < 4yrs while improving comorbidities
- Cardiac rehab with aerobic and resistance training leads to lower all-cause and CV mortality
- Weight management: GLP-1 agonists may be considered if lifestyle modifications are not adequate and BMI  $\geq 27$  kg/m<sup>2</sup>
  - Avoid sympathomimetics such as phentermine
  - Consider bariatric surgery if severe obesity and not meeting goal with lifestyle and meds
- Discuss smoking cessation at every visit
- Alcohol: evidence on how it impacts CV risk is inconsistent (reasonable to recommend < 1 drink for women, < 2 for men)
- Depression:
  - Rates of CV events are doubled in patients with ACS + depression, screening is thus important
- Immunizations: strong correlation between MI and respiratory infections including influenza, covid, and pneumonia

## Primary Prevention of CAD(40-75 years)

Start Statin If:

- LDL  $\geq 190$  mg/dL
- Diabetes
- 10-year ASCVD risk  $\geq 20\%$
- 10-year risk  $\geq 10\%$  +  $\geq 1$  CVD risk factor (USPSTF - B)
- Consider Statin If:
  - 7.5–9.9% risk +  $\geq 1$  risk factor (USPSTF – C):
    - Risk factors include dyslipidemia, diabetes, hypertension, or smoking
  - 7.5–19.9% risk (ACC/AHA)
  - 5–7.4% risk + risk enhancers<sup>†</sup> (ACC/AHA)
- Consider aspirin 40–59 yrs if high ASCVD risk and low bleeding risk (USPSTF – C)

## 5-20% - Consider additional Risk Enhancers<sup>†</sup>

- H/o preeclampsia
- Early menopause
- Rheumatologic disease
- HIV infection
- Strong family history of premature coronary heart disease
- South Asian ancestry
- CKD
- Persistently elevated triglycerides
- low ankle-brachial index
- Elevated hs C-RP, lipoprotein(a), or apolipoprotein B
- Social determinants of health

Scenario	Antithrombotic Therapy	Duration
Chronic Coronary Disease	Aspirin 81 mg/day	Lifelong if tolerated
CCD + PCI	DAPT	Post-PCI for stable angina: DAPT 6 mo → single antiplatelet (extend up to 3yr if low bleeding risk; shorten to 1–3 mo DAPT if high bleeding risk). After ACS: DAPT × 12 mo
CCD with oral anticoagulation + recent PCI	Triple therapy: Oral anticoagulant + DAPT (Aspirin + Clopidogrel)	Anticoagulation strategy: Triple therapy ×1 mo → anticoagulant + clopidogrel 2–6 mo → anticoagulant alone >6 mo.

## CAC Score

- Zero - allows downward risk reclassification (not for DM, smoking, fhx)
- 1-99 - if untreated, repeat in 5yrs
- >100 or >75<sup>th</sup> percentile - statin is reasonable

## CAD and LDL Goals

- Established ASCVD: recommend LDL-C < 70 mg/dL and reasonable to aim for < 55 mg/dL for ACS patients
- Goal 50% reduction of LDL using statin first line followed by ezetimibe then: PCSK9-I, bempedoic acid (Nexletol), siRNA or inclisiran (Leqvio), icosapent ethyl (Vascepa)
- Avoid niacin, fenofibrate, dietary supplements including fish oil, omega-3, folic acid and other vitamins

Test	Use When	Key Limitation / Caution	Quick Tip
<b>Exercise ECG</b>	Low-risk, can exercise, ECG readable	LBBB, paced rhythm, WPW, abnormal baseline ECG	First choice if able to exercise
<b>Stress Echo</b>	Need ischemia or valve info; ECG uninterpretable	Poor imaging in obesity/COPD; caution in severe AS	Exercise preferred; use dobutamine if patient can't exercise
<b>Nuclear Stress</b>	Cannot exercise or poor echo windows	Radiation; avoid vasodilators in active asthma	Good for LBBB; vasodilator used instead of dobutamine
<b>Stress CMR</b>	Detailed perfusion or scar assessment	MRI contraindications; claustrophobia; CKD	No radiation; best image quality
<b>Coronary Calcium (CAC)</b>	Low-risk, stable chest pain	Not for acute symptoms; doesn't show stenosis	CAC = 0 → very low short-term risk
<b>CCTA</b>	Intermediate-risk; want anatomy	Contrast; HR control; incidental findings	Increasingly first-line for stable chest pain
<b>Invasive Angio</b>	High-risk or persistent symptoms	Invasive; procedural risks	Diagnose + treat in same session

## Anti-Anginal Meds

- Beta-blockers: First-line agents for reducing myocardial oxygen demand and preventing angina attacks.
- Calcium Channel Blockers (CCBs): For patients intolerant to beta-blockers or with contraindications (e.g., asthma, bradycardia).
- Nitrates:
  - Short-acting nitrates: Sublingual nitroglycerin for immediate relief of angina.
  - Long-acting nitrates: For patients with frequent angina; ensure nitrate-free intervals to prevent tolerance.
- Ranolazine (Ranexa): Consider for refractory angina not relieved by other medications

## Acute Chest Pain (Outpatient)

- EKG within 10min of arrival
  - ST elevation, new LBBB, Q waves, or new T-wave inversions → possible ACS, to ER
- Clinical prediction rules can guide need for further testing
  - Marburg, INTERCHEST, CAD Consortium for outpatients
    - Suspicious for ACS → ER
    - Low to intermediate risk → stress test, CMR or CCTA

## Coronary Angiography in CAD

### Overview

- Coronary Angiography is an invasive imaging procedure to visualize the coronary arteries, assessing for stenosis, blockages, or abnormalities.
- Procedure: Performed using a catheter inserted through the femoral or radial artery, with contrast dye injected to view the coronary arteries on X-ray.
- Indications
  - Acute Coronary Syndromes (ACS): Urgent angiography indicated in STEMI and high-risk NSTEMI for immediate revascularization.
  - Unstable Angina: In symptomatic patients unresponsive to medical therapy or at high risk based on stress testing.
  - Stable CAD with High-Risk Features: Used when non-invasive tests show high-risk findings (e.g., severe ischemia, left main or multi-vessel disease).

## Clinical Decision Pathways

- HEART Pathway, EDACS, mADAPT, NOTR, 2020 ESC pathway, Marburg, INTERCHEST, CAD Consortium
- Those who are intermediate risk or intermediate to high risk benefit most from cardiac imaging and testing
- There is no validated clinical decision tool with sufficient sensitivity to safely rule out ACS in the outpatient setting. However, outpatient clinicians can use the Marburg Heart Score or INTERCHEST to assess the likelihood of cardiac origin for intermittent chest pain

## CCTA vs. Stress Testing

- Preferred < 65yrs and in those w/o known CAD
- >65yrs or when more obstructive CAD is suspected → Stress testing
- CCTA w/ Functional Fractional Reserve (FFR) can estimate lesion-specific ischemia
- CCTA with no obstruction → 2 yr warranty period
  - Normal stress test → 1 yr warranty period
- Stress imaging options: exercise or pharmacologic stress with ECG, echo, MPI w/ SPECT or PET, CMR imaging

## Revascularization Options\*

### Percutaneous Coronary Intervention (PCI)

- Preferred for single-vessel disease or low-complexity coronary artery disease.
- Indicated for urgent revascularization (e.g., ST-elevation myocardial infarction (STEMI) or high-risk non-STEMI) or when surgical risk is high.
- Drug-eluting stents (DES) are preferred over bare-metal stents to reduce the risk of restenosis.

### Coronary Artery Bypass Grafting (CABG)

- Preferred in patients with:
  - Multivessel disease (especially three-vessel disease with significant proximal LAD involvement).
  - Diabetes mellitus + multivessel dx
  - Left ventricular dysfunction (EF < 35%) with significant coronary artery disease.
  - Left main coronary artery disease, especially if stenosis >50% or involvement of the bifurcation or high complexity anatomy.

\* In patients with angina, revascularization improves symptoms and quality of life more than pharmacotherapy alone.

\* In stable CAD, PCI does not reduce mortality or prevent future heart attacks compared to optimal medical therapy.

## Diabetes and Chronic Coronary Disease

### Diabetes is a Major CAD Risk Factor:

- Increased Risk of Atherosclerosis: Diabetes accelerates atherosclerosis due to chronic hyperglycemia, increased inflammation, and dyslipidemia (e.g., elevated triglycerides, low HDL).

### Treatment

- Statins, aspirin, optimal blood sugar control
- Both SGLT2 inhibitors and GLP-1 agonists offer cardioprotective benefits and reduce cardiovascular mortality in diabetics

## Colchicine and CAD (Secondary Prevention)

### Mechanism of Action

Anti-Inflammatory Effect: colchicine

### Indications

- Secondary Prevention in CAD: colchicine may be considered for patients with stable CAD or recent MI who are already on standard therapy
- May be particularly beneficial in patients with elevated inflammatory markers (e.g., high hs-CRP).

### Key Considerations

- Dosing: Low-dose (0.5 mg once daily) is used to minimize side effects.
- Side Effects: Gastrointestinal symptoms (e.g., diarrhea), myopathy (increased risk with statins), and potential drug interactions, especially with CYP3A4 inhibitors.
- Contraindications: Severe renal or hepatic impairment due to increased risk of toxicity.